

Atty. Dkt. No. 035451-0145 (3682.Palm)

REMARKS

Applicants respectfully request reconsideration of the present application in view of the reasons that follow.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Claims 1-4, 6-19, 22, and 24-27 are now pending in this application.

Claim Rejections – 35 U.S.C. § 103

In section 5 of the Office Action, the Examiner rejected claims 1, 2, 4, and 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Baur et al. (U.S. Patent No. 4,142,781). In the Office Action, the Examiner stated that:

Regarding claim 1, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

a light source system including a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);

a reflective layer-combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50, 30 (Figure 3, column 3, lines 5-7 and 11-20);

the reflective layer 50, 30 reflecting invisible light from the light source 40, and converting the invisible light into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20);

a display layer having pixels alterable with application of electrical charge – interpreted as a liquid crystal display (LCD) (not shown, column 1, lines 17-20) well known in the art, and as evidenced by Baur et al. (U.S. Patent No. 4,142,781);

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the display layer being illuminated by visible light from the reflective layer 50, 30 (not shown, column 1, lines 17-20);

the light source 40 located below the display layer – the lighting system operating as a back light source not shown, column 1, lines 17-20);

However, regarding Claim 1, Chen ('092) does not disclose a light source including a reflective layer having a phosphorescent.

On the other hand, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising a fluorescent plate 1a, and an additional phosphorescent coating – a layer 25 containing phosphorescent particles – (Figure 9, column 9, lines 5-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing the phosphorescent coating as taught by Baur et al. ('781) for the benefits and advantages of amplifying the brightness of the display device, and for providing afterglow of the display after the device is switched-off.

The Examiner indicated that Chen ('092) discloses a reflective layer having a fluorescent coating instead of a phosphorescent coating in a substrate as claimed by Applicants. Applicants submit that this is an incorrect characterization of the disclosure of Chen. There is no teaching or suggestion that the “fluorescent pigment layer 50” is a “coating.” In contrast, Chen states that the “fluorescent pigment layer 50 is interposed between the light conductive plate 10 and the light reflection layer 30” (column 2, line 67 – column 3, line 1). Thus, the disclosure of Chen suggests that the “fluorescent pigment layer 50” is a separate layer, rather than a coating. That is, the “light reflection layer 30” and the “fluorescent pigment layer 50” are two separate components of the device described in Chen, as opposed to a “phosphorescent coated surface” such as that recited in independent Claim 1.

Chen does not teach or suggest a reflective layer having a “phosphorescent coated surface” that both (1) reflects the invisible light and (2) converts the invisible light into visible light, as required by independent Claim 1. In contrast, Chen discloses a separate “fluorescent pigment layer 50” that “converts the wave length of incident exciting light emitted by the

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luminescent crystal” (Chen, column 3, lines 2-3). The light passing through the “fluorescent pigment layer 50” of Chen is then reflected by the “light reflection layer 30.” There is no teaching or suggestion in Chen to provide a single reflection layer that includes a phosphorescent surface that both reflects and converts invisible light to visible light.

Further, in the Office Action, the Examiner has stated that Chen does not disclose a light source including “a reflective layer having a phosphorescent.” Accordingly, the Examiner has relied on Baur et al. to show a reflective layer having a phosphorescent coating on a substrate. Applicants have reviewed the disclosure of Baur et al. and disagree with the Examiner’s characterization of the reference. The electro-optical display device of Baur et al. includes a fluorescent plate 1a. Fluorescent plate 1a is not a reflective layer. Fluorescent plate 1a allows light to pass through the layer as well as containing fluorescent particles. Thus, although there are fluorescent particles in fluorescent plate 1a, the plate 1a is not a reflective layer. The plate 1a is a fluorescing synthetic material, not a coating. Mirrored ends 2 are affixed to the ends or edges of the material of plate 1a. Accordingly, what is described by Baur et al. is a layer or plate 1a in a phosphorescent synthetic material with the light allowed to pass through the layer. Although both of these layers include fluorescent or phosphorescent particles, neither of these layers is a reflective layer as claimed by Applicants. Accordingly, Applicants respectfully submit that all of the claim limitations are not taught or suggested by either of Chen or Baur et al.

Even if the teachings of Baur et al. could be substituted into the device disclosed in Chen, there is no motivation to make such a combination, as Chen motivates one not to use a single reflective and light converting layer because of the inherent disadvantages of using single layers described in Chen. For example, Chen distinguishes his device over prior devices by stating that:

“The important differences are enumerated as follows:

1. The main structural design is different. According to the present invention, the fluorescent pigment layer is formed under the light conductive plate for much better brightness while said layer is formed on the light conductive plate.

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2. According to the present invention ...directly printing fluorescent pigment powder in mesh configurations are utilized by the known devices which must form the fluorescent pigment layer on the light conductive plate.

...

In conclusion, the outstanding features of the LED planar light source according to the present invention are ..., the fluorescent pigment layer provided beneath the light conductive plate.

Chen, Col. 3, lines 53- Col. 4, line 17. Accordingly, Chen teaches that it is not beneficial to use a single layer and in fact distinguishes his device from those that do use a single layer. Thus, Chen can not be said to provide any motivation to combine teachings with a reference which may teach a single reflective and converting layer.

Thus, nothing in Chen or Baur et al. teaches or suggests the use of a single layer that both reflects invisible light and converts invisible light into visible light, as recited in independent Claim 1. Further, the teachings of Chen provide motivation not to use a single layer because of the inherent disadvantages of using single layers described in Chen. Applicants note that the omission of an element (e.g., separate layers for converting and reflecting light) and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 U.S.P.Q. 556 (C.C.P.A. 1966). Here Applicants have effectively removed an element from Chen and maintained its function while doing so in a manner that is contrary to the teachings of Chen.

Accordingly, Applicants respectfully submit that independent claim 1 and its respective dependent claims are therefore allowable.

In section 5 of the Office Action, the Examiner rejected claims 10-16 under 35 U.S.C. § 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view of Vossler (U.S. Patent No. 5,856,819).

Applicants respectfully submit that not all of the claim limitations are taught by any proper combination of the references. In particular, the step of "reflecting the infrared light from

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the light source by the reflective layer” and “converting the infrared light into visible light visible to the human eye by the reflective layer” is not taught or suggested by any combination of Chen and Vossler, alone, or in any proper combination. The Examiner has cited the reflective layer 50, 30 of Chen being a reflective layer as recited by Applicants. Applicants however disagree. Applicants’ disagreement with the application of Chen in the rejection is clearly explained with reference to the arguments made above with respect to independent claim 1. These arguments are equally applicable to the rejection of claim 10 because Vossler does not fill the deficiency left by the application of the Chen reference. Applicants respectfully submit that independent claim 10 and its respective dependent claims are allowable.

In section 6 of the Office Action, the Examiner rejected claims 17-19, 22, and 24-27 under 35 U.S.C. § 103(a) as being unpatentable over Chen, Baur et al., and Kim (U.S. Patent No. 6,204,902). Applicants respectfully submit that all of the arguments made above with respect to claims 1 and 10 and the applicability of Chen and Baur et al. are equally applicable to independent claim 17. The addition of Kim does not fill the deficiencies of the Baur et al. and Chen references. Accordingly, Applicants respectfully submit that independent claim 17 and its respective dependent claims are therefore allowable.

* * * * *

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit

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Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

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